Amendments to the Drawings:

The attached drawing sheet includes changes to figures 1A and 1B. This sheet replaces the original sheet including figures 1A, 1B, and 2.

REMARKS

Claims 1-3, 6-10, and 14-20 are pending in the application. In this response, claims 1, 2, 6, 7, 9, 10, and 17 have been amended; claims 3, 8, 15, 16, and 18-20 are canceled; claim 14 is presented for reconsideration; figures 1A and 1B are replaced; and the specification is amended to correct unclear, inexact, or verbose terms.

It is respectfully submitted that the above amendments introduce no new matter within the meaning of 35 U.S.C. § 132.

Applicants submit that claims 1, 2, 6, 7, 9, 10, and 17, and original claim 14, are in condition for allowance.

OBJECTION TO THE DRAWINGS

In the outstanding Office Action, the Examiner objected to the drawings because figures 1A and 1B lacked an appropriate legend designating that they illustrate only prior art.

RESPONSE

By this Response and Amendment, Applicants submit a replacement sheet of drawings which adds the label "prior art" to figures 1A and 1B.

Accordingly, Applicants respectfully request that the Examiner withdraw the objection to the drawings.

OBJECTION TO THE SPECIFICATION

In the outstanding Office Action, the Examiner objected to the specification for containing unclear, inexact, or verbose terms, and drew the applicants' attention to the paragraph beginning on page 2, line 16 of the specification.

RESPONSE

By this Response and Amendment, Applicants have reviewed the specification and have amended those paragraphs which were deemed to be necessary. Applicants respectfully submit that the specification fully complies with the requirements of 35 U.S.C. §112, first paragraph and do not introduce any "new matter."

Accordingly, it is respectfully requested that the objection to the specification be withdrawn.

OBJECTIONS TO THE CLAIMS

In the outstanding Office Action, the Examiner objected to claims 6 and 20 for informalities.

RESPONSE

By way of this response and amendment, claim 6 has been rewritten, and the term "comprises," to which the Examiner objected, has been removed.

The objection to claim 20 has been obviated by the cancellation of this claim.

Accordingly, it is respectfully requested that the objection to Claim 6 and Claim 20 be withdrawn.

REJECTION UNDER 35 U.S.C. §112

In the outstanding Office Action, claims 1-3, 6-10, and 14-20 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicants regard as the invention. The Examiner drew attention to the terms "in a regular regime" in claim 1, "non-exhaustive list" in claim 2, "matched from the point of at least

one optical characteristics input of the assembly being connected to the input of the 1st stage, output of the 2nd stage being connected to the output of the assembly, output of the 1st stage and input of the 2nd stage..." in claim 6, and "a set of average characteristics designed for the 2nd stage" in claims 7 and 16.

RESPONSE

By this Response and Amendment, Applicants have amended claims 1, 2, 6, and 7 so as to particularly point out and distinctly claim their invention.

In particular, the term "leaving one of the stages to function in a regular regime" has been removed from claim 1, which now reads that the control-communication circuit, *inter alia*, "prevent[s] automatic shutting down of one of said first and second stages whenever the other of said first and second stages is shut down." Support for this amendment may be found in the specification, at page 11, line 27 - page 12, line 4; and at page 12, lines 22-26.

The term "non-exhaustive list" has been removed from claim 2, which now reads "the group consisting of." Applicants submit that claim 2 is now worded as a proper Markush claim.

The terminology of matching optical characteristics in claim 6 has been removed, and now appears only in claim 7, which the examiner did not object to for its terminology in this way. Moreover, claim 7 has been amended to remove the term "average." Claim 7 now directly addresses "a set of characteristics" for each stage.

Further, by this amendment, claims 3, 8, 15, 16, and 18-20 are canceled.

Claims 9 and 10 depend from claim 6. As applicants submit that the objection under 35 U.S.C. §112 to claim 6 has been overcome, applicants respectfully request that the Examiner reconsider and withdraw the objections under 35 U.S.C. §112 to claims 9 and 10. Applicants note that claims 9 and 10 have been amended to match the language used in the amendments to

claim 6.

Claim 14 depends from claim 1, and claim 17 has been amended to now depend from claim 1. As applicants submit that the objection under 35 U.S.C. §112 to claim 1 has been overcome, applicants respectfully request that the Examiner reconsider and withdraw the objections under 35 U.S.C. §112 to claims 14 and 17. Applicants note that claim 17 has been amended to match the language used in the amendments to claim 1.

As Applicants submit that the above amendments address all of the examiner's cause for rejection under 35 U.S.C. §112, Applicants request that the Examiner withdraw all such rejections to these claims.

REJECTION UNDER 35 U.S.C. §102(b)

In the outstanding Office Action, the Examiner rejected claims 1 and 14 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,778,132 to Csipkes et al. (hereinafter, "Csipkes").

RESPONSE

Reconsideration and withdrawal of the rejections are respectfully requested.

For a reference to anticipate an invention, all of the elements of the claimed invention must be present in the reference. The test for anticipation under section 102 is whether each and every element as set forth in the claims is found, either expressly or inherently, in a single prior art reference. *Verdegaal Bros. V. Union Oil Co. of California,* 2 USPQ2d 1051, 1053 (Fed. Cir. 1987. The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.,* 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). The elements must also be arranged as required by the claim. *In re Bond,* 15 USPQ2d 1566 (Fed. Cir. 1990).

Applicants submit that Csipkes fails to disclose each and every element of claim 1 as amended.

Claim 1 has been amended to include the "control-communication circuit" of now-canceled claim 15, to which the Examiner did not raise an objection under 35 U.S.C. §102(b).

Specifically, Claim 1 now recites "a two-stage optical amplifier, comprising a first stage comprising at least one optical amplifying unit [and]a second stage comprising at least one optical amplifying unit" wherein the amplifier is provided with, *inter alia*, "a control-communication circuit comprising a control-communication channel between the first and second stages that controls the first and second stages so as to allow dynamic matching at least one optical characteristic of one of said first and second stages to respective at least one characteristic of the other of said first and second stages, and to prevent automatic shutting down of one of said first and second stages whenever the other of said first and second stages is shut down."

Support for this amendment in the specification may be found, *inter alia*, on page 6, line 24, through page 7, line 4; on page 7, lines 15-18; on page 11, line 27, through page 12, line 4; and on page 12, lines 22-26.

Csipkes, in contrast, teaches a "multiple stage optical amplifier" in which "each stage…is housed in a separate optical cassette" and "cassette regions are provided for receiving one or more passive optical components used with the first stage of the optical amplifier." (Cspikes, abstract) Cassette regions are also provide for receiving one or more passive optical components within the second stage of the amplifier. (Csipkes, summary of the Invention, second paragraph).

Csipkes fails to disclose the claimed element of "a control-communication circuit comprising a control-communication channel between the first and second stages that controls the first and second stages so as…to prevent automatic shutting down of one of said first and second

stages whenever the other of said first and second stages is shut down." (Present application, claim 1) The Examiner states that, in Csipkes, "pump light propagates through both the first and the second amplifier." (Office Action, Page 5) It is correct that in a regular optical amplifier, the pump light propagates through both the first and second amplifier stages in the optical line. However, if a fiber cut occurs at one of the Csipkes' stages, the light stops propagating via the line and both stages of the Csipkes amplifier will immediately be shut down. Csipkes does not disclose, teach, or suggest a "control-communication circuit comprising a control-communication channel" provided at the two-stage amplifier, which could "prevent automatic shutting down of one of said first and second stages whenever the other of said first and second stages is shut down." Csipkes, in fact, lacks any control-communication channel provided at the two-stage amplifier, and makes no reference whatsoever to the need for prevention of an automatic shutting down.

Further, Csipkes fails to disclose the claimed element of "a control-communication circuit comprising a control-communication channel between the first and second stages that controls the first and second stages so as to allow dynamic matching at least one optical characteristic of one of said first and second stages to respective at least one characteristic of the other of said first and second stages." (Present application, claim 1) The examiner notes that "the optical amplifier [of Csipkes] is adapted for matching at least one optical characteristic of the two stages, *e.g.* signal wavelength." However, Csipkes does not disclose, teach or suggest a control communication channel provided at the two-stage amplifier, nor any other structure *provided at the amplifier*, which would *perform* "matching at least one optical characteristic of one of said first and second stages to respective at least one characteristic of the other of said first and second stages." (ibid). Moreover, Csipkes fails to teach a "dynamic matching" process, as recited in amended Claim 1, and makes no reference to a need for any dynamic matching between the two stages. As noted above,

Csipkes teaches only the reception of *passive* optical components within the cassettes (see Csipkes, abstract).

Finally, Claim 1 has been amended to recite "a two-stage optical amplifier" with "contacts disposed at a mid-stage between said first and second stages." Support for this amendment in the specification may be found, *inter alia*, in the paragraph beginning on page 12, line 5, and as elements 28 and 29 in figure 2, the "so-called mid-stage contacts...of the assembly." (Specification, Detailed Description of the invention, page 12, line 18). Applicants submit that Csipkes fails to disclose, teach, or suggest contacts disposed at the mid-stage of the amplifier.

As Csipkes fails to disclose, teach, suggest, or make obvious all of the claimed features of independent Claim 1, Applicants respectfully request that Examiner reconsider and withdraw the rejection to claim 1.

Further, as claim 14 now depends on amended claim 1, it is believed that it too is in condition for allowance, for at least the reasons given above.

REJECTION UNDER 35 U.S.C. §103(a)

In the outstanding Office Action, claims 2 and 6 are rejected under 35 U.S.C. §103(a) as being unpatentable over Csipkes in view of U.S. Patent No. 6,611,371 to Wigley et al. (hereinafter, "Wigley.")

RESPONSE

Reconsideration and withdrawal of the rejections are respectfully requested.

To establish a *prima facie* case of obviousness, the Examiner must establish: (1) that some suggestion or motivation to modify the references exists; (2) a reasonable expectation of

for the reasons stated above that Claim 1 is patentable. Applicants further submit that Wigley fails to cure the deficiencies of Csipkes as applied to claim 1, from which claims 2 and 6 (as amended) depend.

Claim 2, as amended, recites "The two-stage optical amplifier according to Claim 1, wherein: the first and second stages are preliminarily matched to one another on at least one optical characteristic so that the first stage of the amplifier is preliminarily adjusted to match to a set of characteristics of the second stage, the second stage of the assembly is preliminarily adjusted to match to a set of characteristics of the first stage, the first stage of the amplifier approximately matches a completmentary stage of said amplifier or of another similar amplifier, and the second stage of the amplifier approximately matches a complementary stage of said amplifier or of another similar amplifier; and said control-communication channel interconnects the two stages with one another for controlling at least one parameter of either the first of second stage selected from the group consisting of: gain, gain flatness, and gain tilt."

Claim 6 has been amended to include elements of now-canceled claim 18, to which the Examiner did not raise an objection under 35 U.S.C. §103(a).

Specifically, claim 6 recites "[t]he two-stage optical amplifier according to Claim 1, wherein: the two-stage optical amplifier comprises at least one input and at least one output; the first stage comprises at least one input and at least one output; the second stage comprises at least one input and at least one output; the at least one input of the two-stage optical amplifier is connected to the at least one input of the first stage, the at least one output of the two-stage optical amplifier is connected to the at least one output of the second stage, the at least one output of the first stage and the at least one input of the second stage are respectively connected to the contacts disposed at a mid-stage of the two-stage optical amplifier, thereby allowing the introduction of an optical element either between

the first stage and the second stage of the two-stage optical amplifier, or between any of the stages of said two-stage optical amplifier and a complementary stage of another similar two-stage optical amplifier, and the control-communication circuit is arranged so as to be selectively configurable either to form ~~a~~ the control-communication channel between the first stage and the second stage of said two-stage optical amplifier, or to disconnect said first stage from said second stage while enabling each of the first stage and the second stage to form a separate control-communication circuit and control-communication channel with a complementary stage located on another similar two-stage optical amplifier."

As discussed previously, Csipkes teaches a multiple stage optical amplifier in which each stage is housed in a separate optical cassette and cassette regions are provided for receiving one or more passive optical components used with the first or second stage of the optical amplifier.

Wigley teaches an optical device, including an optical amplifier and a tunable optical filter coupled to the optical amplifier. (Wigley, summary of the invention). The optical filter "changes the gain slope of the optical amplifier in response to a change in a single parameter of the optical filter." (Wigley, summary of the invention).

Wigley fails to cure the deficiencies of Csipkes, as it fails to disclose, teach, or suggest the claimed element of "a control-communication circuit comprising a control-communication channel between the first and second stages that controls the first and second stages so as to allow dynamic matching at least one optical characteristic of one of said first and second stages to respective at least one characteristic of the other of said first and second stages." (Present application, claim 1) Moreover, Wigley fails to disclose, teach, or suggest a "control-communication channel" which "interconnects the two stages with one another," (Present application, claim 2) or a "control-communication circuit" which forms a "control-communication channel" (Present application, claim 6).

Wigley, in contrast, describes a tunable optical element which can be placed between amplifier stages. Wigley describes varying a parameter (e.g. gain, or slope of the gain spectrum) of an optical amplifier *as a whole*, for example, by coupling to the optical amplifier a tunable optical filter or a variable optical attenuator. See Wigley, summary of the invention, column 3, lines 6-7: "In one embodiment of the invention, the optical filter changes the gain slope of the optical amplifier..."; lines 26-28: "[i]t is another aspect of the present invention to provide a method of varying the slope of the gain spectrum of an optical amplifier." None of the drawings, nor any portion of the Wigley reference mentions the particular characteristics of each amplifier stage (see present application, claims 1, 2, and 6), or the feature of matching said characteristics (again, see present application, claims 1, 2, and 6).

As the combination of Csipkes and Wigley fails to disclose, teach, or suggest "a control-communication circuit comprising a control-communication channel between the first and second stages that controls the first and second stages so as to allow dynamic matching at least one optical characteristic of one of said first and second stages to respective at least one characteristic of the other of said first and second stages," applicants submit that Wigley fails to cure the deficiencies of claim 1. Applicants respectfully request that Examiner reconsider and withdraw the rejections to claims 2 and 6, which depend from claim 1.

CONCLUSION

In light of the foregoing, Applicants submit that the application is now in condition for allowance. If the Examiner believes the application is not in condition for allowance, Applicants respectfully request that the Examiner contact the undersigned attorney if it is believed that such contact will expedite the prosecution of the application.

In the event this paper is not timely filed, Applicants petition for an appropriate extension of time. Please charge any fee deficiency or credit any overpayment to Deposit Account No. 14-0112.

Respectfully submitted,

Date: _____, 2006

By: _____

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APPENDIX